Subject: Re: Points in a rectangle with an angle
Posted by Craig Markwardt on Wed, 05 Apr 2006 16:53:25 GMT
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JJMeyers2@gmail.com writes:
> Hello,
>
> I have a problem in IDL that I was wondering if anyone has any idea how
> it can be done.
> I have a set of coordinates and I am trying to figure out how many of
> the coordinates are inside a rectangle. I know the coordinates of the 4
> edges of the rectangle but the problem is that the rectangle is at an
> angle in the x,y axis (I know the slope). I can not just say
> coords=where((x LE xmax) AND (x GT xmin) AND (y LE ymin) AND (y GT
> ymax))
> because that will give me coordinates of a rectangle without an angle
> (parallel to the y axis).
> Is there any function in IDL that might be doing that?

Not really, but it's pretty easy to do yourself.

Assume that the rectangle is centered at (XCENT,YCENT) and has a WIDTH
and HEIGHT in its body coordinate system. Also, assume that the
rectangle is rotated THETA degrees counterclockwise from the "world" X axis.

```
;; Translate to center-of-box coordinates (xp,yp)
xp = x - xcent
yp = y - ycent
;; Rotate into box coordinates (u,v)
u = cos(theta*!dtor)*xp - sin(theta*!dtor)*yp
v = sin(theta*!dtor)*xp + cos(theta*!dtor)*yp
;; Do the selection
wh = where(abs(u) LT width/2 AND abs(v) LT height/2)
```

This takes advantage of the fact that in center-of-box coordinates,
half of the box is left and right of the origin, and above and below
the origin. The only tricky part is getting the signs right, which I
think I did.

Craig

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